

# Towards evidence based medicine for paediatricians

Edited by Bob Phillips

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In order to give the best care to patients and families, paediatricians need to integrate the highest quality scientific evidence with clinical expertise and the opinions of the family.<sup>1</sup> *Archimedes* seeks to assist practising clinicians by providing "evidence based" answers to common questions which are not at the forefront of research but are at the core of practice. They are based on an original format from the *Journal of Accident and Emergency Medicine*.<sup>2</sup>

A word of warning. These best evidence topic summaries (BETs) are not systematic reviews, though they are as exhaustive as a practising clinician can produce. They make no attempt to statistically aggregate the data, nor search the grey, unpublished literature. What *Archimedes* offers are practical, best evidence based answers to practical, clinical questions.

Each topic follows the same format. A description of the clinical setting is followed by a structured clinical question. (These aid in focusing the mind, assisting searching,<sup>3</sup> and gaining answers.<sup>4</sup>) A brief report of the search used follows—this has been performed in a hierarchical way, to search for the best quality evidence to answer the question.<sup>5</sup> A table provides a summary of the evidence and key points of the critical appraisal. For further information on critical appraisal, and the measures of effect (such as number needed to treat, NNT), books by Sackett<sup>6</sup> and Moyer<sup>7</sup> may help. A commentary is provided to pull the information together, and for accessibility, a box provides the clinical bottom lines.

Readers wishing to submit their own questions—with best evidence answers—are encouraged to read the Instructions for Authors at <http://www.archdischild.com>. Three topics are covered in this issue of the journal.

- ▶ Does iron have a place in the management of breath holding spells?
- ▶ Is omeprazole helpful in the management of children with reflux oesophagitis?
- ▶ Does oral sucrose reduce the pain of neonatal procedures?

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## REFERENCES

- 1 **Moyer VA**, Elliott EJ. Preface. In: Moyer VA, Elliott EJ, Davis RL, et al, eds. *Evidence based pediatrics and child health*. London: BMJ Books, 2000.
- 2 **Mackway-Jones K**, Carley SD, Morton RJ, et al. The best evidence topic report: a modified CAT summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;15:222-6.
- 3 **Richardson WS**, Wilson MC, Nishikawa J, Hayward RS. The well-built clinical question: a key to evidence-based decisions. *ACP J Club* 1995;123:A12-13.
- 4 **Bergus GR**, Randall CS, Sinift SD, et al. Does the structure of clinical questions affect the outcome of curbside consultations with specialty colleagues? *Arch Fam Med* 2000;9:541-7.
- 5 <http://cebmlr2.ox.ac.uk/docs/levels.htm> 6
- 6 **Sackett DL**, Starus S, Richardson WS, et al. *Evidence-based medicine. How to practice and teach EBM*. San Diego: Harcourt-Brace, 2000.
- 7 **Moyer VA**, Elliott EJ, Davis RL, et al, eds. *Evidence based pediatrics and child health, Issue 1*. London: BMJ Books, 2000.

## Economic analyses

For the uninitiated, the realm of economic analysis appears a fiery pit of sulphur, brimstone, and fiends. I am assured it doesn't get much better after initiation. A short guide to the types of analysis follows:

- **Cost minimisation**: Reports only costs—should be used when good data support the equivalence of the options presented.
- **Cost effectiveness**: Reports the costs and clinical effectiveness of various options, using "natural units" (e.g. years of life, symptoms scores, etc). Does not include utility adjusted reports (see next).
- **Cost utility**: Reports the costs and utilities of option. Utilities are an assessment of quality of life, generally scored from 0 (worst) to 1 (best), and summarised as the equivalent number of years at utility = 1; the quality adjusted life year or QALY. Utilities are measured in various ways, for example: rating scales ("How's life with asthma—from 0 to 10?"); time trade off ("If I could cure you of your diabetes, but you died in five years, would it be worth it? How about 10 years? 15?"); or standard gamble ("If I had a treatment for your cerebral palsy, worked perfectly in 9/10 cases but killed in 1/10, would you take it? How about if it killed in 1/100? etc").
- **Cost benefit**: Report where the utilities have been given monetary values and an overview is given.

## Does iron have a place in the management of breath holding spells?

**Report by Robert Boon, Specialist Registrar Paediatrics, Gosford Hospital, New South Wales, Australia**

A 2 year old child is seen in the outpatients department with a history of breath holding spells for the past three months, occurring about 3-4 times per week. These are causing her mother a great deal of concern. You consider whether or not a course of iron would reduce the frequency of these attacks.

### Structured clinical question

In a 2 year old child with breath holding spells [patient], will a treatment with iron [intervention] reduce the frequency of episodes [outcome]?

### Search strategy and outcome

Secondary searches—Cochrane, Clinical Evidence—none. Medline 1996-2001, using the OVID interface.

Table 1

Citation	Study group	Study type (level of evidence)	Outcome	Key result	Comments
Daoud <i>et al</i> (1997)	67 children with BHS were randomised to either ferrous sulphate or placebo	RCT (level 1b)	Frequency of BHS per month after 16 weeks. Complete response (no attacks), partial response ( $\geq 50\%$ reduction), minimal or no response ( $<50\%$ reduction)	Complete response in 51.5% treated v 0% in non-treatment group. Partial response in 36.4% treated group v 5.9% in non-treatment group. NNT for any response = 2 (95% CI 2 to 3)	The baseline mean Hb in children who showed a response was 86 g/l compared to 106 g/l in those that responded poorly ( $p=0.004$ )
Mocan <i>et al</i> (1999)	91 children with breath holding spells. 63 with concomitant IDA	Case control (level 4)	Frequency of BHS over the 3 months study period. Complete response (no attacks), partial response ( $\geq 50\%$ reduction), no response	Complete response in 32% treated group and 21% more had partial response. NNT (for either a partial or complete response) = 2 (95% CI 2 to 3)	Only those children with BHS and IDA were treated with iron. The placebo group were those with BHS but normal Hb
Bhatia <i>et al</i> (1990)	50 children with BHS	Case series (level 4)	A reduction in frequency and severity of BHS following a course of iron which was continued until Hb $>11$ g/dl	96% of the study group had IDA (mean Hb = 8.12 g/dl). 82% showed a response within 2 weeks. After three weeks 100% of cases had shown an improvement	Failed to define improvement

Breath holding spells AND iron therapy, limited to (English & Child)—six hits: two letters, an editorial and three papers as discussed below. See table 1.

### Commentary

The literature reviewed suggests that a trial of iron therapy will reduce the frequency of breath holding spells.

All these papers showed a high incidence of iron deficiency anaemia associated with breath holding spells. A full blood count would therefore be warranted in the work up of these children. Treatment is more likely to be successful when there is concomitant iron deficiency anaemia.

Length of treatment varied between 3 and 16 weeks with ferrous sulphate (5–6 mg/kg/day). A course of 8 weeks would seem reasonable—long enough to improve any anaemia.

There was no mention of side effects with ferrous sulphate treatment in any of these papers. Typically these would include nausea, vomiting, diarrhoea, and change in stool colour; the latter presumably making it difficult to complete a double blind study of iron therapy.

There is also the risk of accidental overdose by the patient or siblings to be considered. However, the risk of overdose with paediatric preparations of iron is minimal compared with adult preparations.

The decision to treat also needs to be balanced against the natural course of breath holding spells which are invariably benign and self limiting—both in the short and long term.

### ► CLINICAL BOTTOM LINE

- Iron therapy is of benefit in children with breath holding spells (NNT=2).
- Improvement is more likely in those with concomitant iron deficiency anaemia (NNT=1).

**Daoud AS**, Batieha A, Al-Sheyyab M, *et al*. Effectiveness of iron therapy on breath-holding spells. *J Pediatr* 1997;**130**:547–50.

**Mocan H**, Yildiran A, Orhan F, *et al*. Breath holding spells in 91 children and response to treatment with iron. *Arch Dis Child* 1999;**81**:261–2.

**Bhatia MS**, Singhal PK, Dhar NK, *et al*. Breath holding spells: an analysis of 50 cases. *Indian Pediatr* 1990;**27**:1073–9.

## Is omeprazole helpful in the management of children with reflux oesophagitis?

**Report by Lizy A Varughese, Lynnette J Mazur, University of Texas Houston Medical School, Houston, TX, USA**

An 18 month old boy with cerebral palsy is brought to your office because of “spitting up” after feeds. It has been a problem for the past several months, but is progressively worsening and now occurs after every meal and even at night. He was breast fed for 12 months and has slight developmental delay. Height and head circumference are between 25–50th centile, but weight is below 5th centile for age. A barium swallow reveals significant gastro-oesophageal reflux to the pharynx. A gastroscopic examination with biopsy reveals moderate oesophagitis without eosinophilia. You wonder if a proton pump inhibitor will be an effective treatment.

### Structured clinical question

In children with gastro-oesophageal reflux [patients] does treatment with a proton pump inhibitor [intervention] decrease symptoms, increase gastric pH, and improve endoscopic findings [outcome]?

### Search strategy and outcome

Pubmed: “treatment of gastroesophageal reflux in children”—limited to ages 0–18, English language, and human subjects. 1966–present: 1039 articles, seven relevant. See table 2.

### Commentary

There is adequate and consistent evidence that the proton pump inhibitor omeprazole is effective in the treatment of gastroesophageal reflux in children. In the five studies that addressed clinical outcomes, all patients had improvement in their symptoms. All of the studies addressed endoscopic outcomes and all patients had improvement in their findings after